



D3.1

Results of validation of practices from the Exchange Platform M13

Project Title	B-THENET (BEST PRACTICES AND INNOVATIONS FOR A SUSTAINABLE BEEKEEPING)
Contract No.	101059812
Instrument	Horizon Europe Coordination and support action (CSA)
Thematic Priority	Innovative governance, environmental observations, and digital solutions in support of the Green Deal
Start of Project	1 September 2022
Duration	48 months



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Deliverable title	Results of validation of practices from the Exchange Platform M13
Deliverable number	D3.1
Deliverable version	Version number 1.0
Previous version(s)	-
Contractual date of delivery	30/09/2023
Actual date of delivery	30/09/2023
Deliverable filename	D3.1 Results of validation of practices from the exchange platform M13
Nature of deliverable	Report
Dissemination level	Public
Number of pages	19
Work Package	WP3
Task(s)	Task 3.1
Partner responsible	APIMONDIA
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Abstract	Deliverable 3.1 presents the preliminary results of the validation of practices published in the Exchange Platform of the project B-THENET. In 2023, the multiple actors of B-THENET (including beekeepers, advisors, researchers, and other stakeholders of the sector) developed in 13 EU languages, 22 good beekeeping practices and biosecurity measures falling under the themes of “apiary set-up and management/maintenance” and “varroosis”. All practices were made available online as easily explained procedures following a logical sequence. Platform users were asked by their National B-THENET Centres to assess each individual practice and contribute to the description with the aim of presenting, in an exhaustively way their national beekeeping reality. Practices were considered validated online when: 1) The platform community of EU beekeepers and advisors provided $\geq 75\%$ of positive votes (thumbs up and down were used to express positive or negative votes in the platform). 2) The National B-THENET Centres provided official approval.

	Results of the final validation will be reported on 31 st December 2023, when practices will be considered “Best Beekeeping Practices” and moved by the coordinator into the Repository Platform.
Keywords	EU beekeeping, Thematic Network, Online Validation, Good Beekeeping Practices, Biosecurity Measures in Beekeeping, Best Beekeeping Practices, Portal of the EU beekeeper

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Revision History

VERSION	DATE	REVIEWER	MODIFICATIONS
1	30/09/2023	A. Gyorffy, M. Pietropaoli, G. Formato	Validation

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Table of Abbreviations and Acronyms

Abbreviation	Meaning
TN	Thematic Network
GBPs	Good Beekeeping Practices
BMBs	Biosecurity Measures in Beekeeping
BBPs	Best Beekeeping Practices

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1 Executive Summary

Deliverable 3.1 presents the results of the online validation of the Good Beekeeping Practices (GBPs) and Biosecurity Measures in Beekeeping (BMBs) developed by the multiple actors of the project B-THENET (GA N. 101059812).

During the first 12 months of the project, the 13 National B-THENET Centres located in Austria (UGRAZ), Belgium (UGENT), Croatia (UNIZG), Germany (UHOH), Greece (HAO), Hungary (UVMB), Italy (APIMONDIA), Poland (INHORT), Slovakia (UVLF), Slovenia (SBA), Spain (UCM), Sweden (SLU), and coordinated by Denmark (BIAVL), worked alongside their national beekeepers and advisors to fully develop the inventory of 22 GBPs and BMBs under the themes of “varroosis” and “apiary set-up and management/maintenance”.

GBPs and BMBs were made available online in the Exchange Platform of the project, in the format of user-friendly, step-by-step protocols including images, tags (e.g., climatic area, tools and supplies, production line, etc.), links to useful innovations and scientific references. The 13 B-THENET Centres developed the practices in their 13 national languages with the help of their local beekeepers, with the aim of reflecting their national beekeeping reality.

In September 2023 the practices described in the Exchange Platform were validated by the community of platform users (beekeepers, advisors, and other stakeholders), who were engaged through both in-person and online meetings. Users were asked if the practice was described exhaustively (text and images), and if it corresponded to their country reality, and could provide either a positive or a negative vote to each individual practice. Only practices obtained in the “Exchanging activity” (theoretical and practical) and written under the responsibility of each B-THENET centre are voted online. Practices that received $\geq 75\%$ of positive votes by platform users and that were approved by each beneficiary of the (National or International) B-THENET Centre were considered formally “validated”. Those will be subsequently transferred to the Repository Platform by the B-THENET Coordinators being recognized as Best Beekeeping Practices (BBPs).

2 Introduction

The project B-THENET, aims to modernise the beekeeping sector by sharing knowledge ready to be put into practice and fostering best practices exchange.

In particular, the project pursues the following objectives:

- Modernize the EU beekeeping sector by establishing a multi-actor network with complementary knowledge that connects beekeepers, researchers, advisors, and the other actors in the apiculture sector.
- Collect, categorize (“Inventory”), and select good practices for sustainable beekeeping and new research findings ready to put into practice or not sufficiently known using a bottom-up methodology.
- Create a digital knowledge platform (“Exchange”) to increase the flow of practical information and knowledge sharing within the EU.
- Create a digital knowledge platform (“Repository”) to collect, share and store knowledge on best practices, for the long term, facilitating and harmonizing the education of the EU beekeeping sector.

To select, develop and disseminate Best Beekeeping Practices in Europe, B-THENET brings together the expertise of beekeepers, researchers, advisors, and other experts in the field. The collaborative work is carried out both in person, during “exchange events” organised by the 13 National B-THENET Centres, and on the project's Exchange Platform, the first portal for the European beekeeper (<https://www.bthenet.eu/>).

On the portal, GBPs and BMBs are discussed in 13 European languages, corresponding to the national language of the 13 National B-THENET Centres, namely:

- Austria (UGRAZ)
- Belgium (UGENT)
- Croatia (UNIZG)
- Denmark (BIAVL – chair of National Centres)
- Germany (UHOH)
- Greece (HAO)
- Hungary (UVMB)
- Italy (APIMONDIA)
- Poland (INHORT)
- Slovakia (UVLF)
- Slovenia (SBA)
- Spain (UCM)
- Sweden (SLU)

From May 2023 until August 2023, good practices were developed in the platform as ready-to-use, "step-by-step" procedures that include detailed description of each step, pictures, useful

links, and scientific references. Users of the platform, could interact with the practices by adding comments, asking questions, and making suggestions to improve the content.

In September 2023 online validation started. Platform users were invited to assess whether what written in the practices was exhaustive (text and images), if it represented their national approach to beekeeping, and to provide a negative or a positive vote accordingly. By December 2023 the validation process will be considered complete, and the validated GBPs and BMBs will be formally recognised as BBPs, moved to the Repository Platform of the project, and will become training material for EU beekeepers and advisors.

3 Methodology for the validation of practices in the Exchange Platform

The inventory of 22 beekeeping practices and biosecurity measures (Table 1) identified as priority by EU beekeepers and advisors was developed in the Exchange Platform in 13 EU languages.

Table 1. Inventory of priority practices that will be developed by B-THENET in 2023. New practices suggested by EU beekeepers are marked with a plus sign (+).

CATEGORY: GOOD BEEKEEPING PRACTICES Theme: “APIARY SET-UP AND MANAGEMENT/MAINTENANCE” Practice container: PROPERLY PLACE HIVES IN THE APIARY	
Cluster 1: Identify a proper area to locate the apiary	
Avoiding exposure to pollutants (e.g., pesticides, heavy metals, etc.)	
Setting-up apiaries in an area accessible to vehicles (e.g., relevance of solid/dry ground)	
Avoiding areas where allergenic (e.g., <i>Ambrosia trifida</i> and <i>Artemisia vulgaris</i>) or toxic (e.g., containing pyrrolizidine alkaloids, like <i>Echium</i> spp., <i>Eupatorium</i> and <i>Senecio</i> spp. etc.) plants could be found in a significant quantity	
Avoiding areas exposed to excessive humidity and wind	
(+ Ensuring presence of trees (or other barriers) to create protection against weather stressors (e.g., heat, wind etc.)	
(+ Maintaining appropriate distance from other apiaries (for hive production and bee health)	
(+ Having enough space for storage rooms/working tools	
(+ Keeping safe distance from houses/ villages (for human safety)	
(+ Preventing theft of hives (e.g., assess presence/build a fence around the apiary)	
Cluster 2: Setting-up of the apiary	
Keeping an appropriate number of hives (e.g., consider the amount of melliferous plants and sources of water available in the area where the apiary is located)	
(+ Seasonally relocating the apiary (e.g., taking into account the season, wintering close to warmer areas)	
Proper positioning of the hive (e.g., providing hives with a proper stand, guaranteeing proper space between hives, providing a proper orientation of the hive entrances so that the sun can reach them from the early morning hours to sunset)	
(+ Avoiding obstacles for the bees (e.g., high grass/snow in front of the hive entrance)	

CATEGORY: BIOSECURITY MEASURES for Varroosis Theme: “VARROOSIS” Practice container: “GUARANTEE BEST EFFICACY OF ANTI-VARROA TREATMENTS, ESPECIALLY WITH ORGANIC COMPOUNDS”	
Cluster 1: How to conduct	
Assessment of varroa infestation level during the beekeeping season	
(+) Identification of the best moment for varroa treatments according to the national climatic areas.	
Cluster 2: Proper use of low environmental impact compounds	
Use of oxalic acid (including sublimated)	
Use of formic acid	
Use of thymol (e.g., applying only when environmental temperature is high enough).	
Use other low environmental impact compounds (if medicines are available in your country)	
Cluster 3: Biotechniques	
Brood removal (e.g., partial drone/worker brood removal or total brood removal/shook swarm)	
Queen caging (e.g., use of cages that do not permit the queen to lay eggs or trapping comb)	
(+) Heat treatments	
Warnings and restrictions for BMBs: - to treat varroa according to the national legislation (e.g., use only medicines authorized for honey bees); - to follow the label indication (also considering dispensers, sublimators, etc). - to rotate active ingredients to reduce the risk of varroa resistance. - to treat simultaneously all colonies of the same apiary and all apiaries in the same area (cooperation with beekeepers in the neighbourhood to integrate varroa control)	

For their online validation, National B-THENET Centres engaged the digital community of beekeepers and advisors through in-person “Exchange meetings”. During these events, the National Centres together with their Collaborating Partners invited their beekeepers and advisors to discuss the practices available in the platform. Practices were shown and beekeepers were asked two questions:

1. Was the practice (images and text) described exhaustively?
2. Does the practice reflect the beekeeping reality of your country?

Beekeepers could then provide a positive or negative vote, by signing in the Exchange Platform and providing a thumb up/thumb down to the respective practice (this feature was built in the Platform and made available since the beginning of September 2023).

Responses were collected until the 30th of September, and the preliminary results are published in the present deliverable in section 4. Only practices that received ≥ 10 votes with a ratio of $\geq 75\%$ of positive votes were considered validated by the online community. Those who didn't reach such threshold or that weren't considered exhaustively described by the National or International B-THENET Centres beneficiary, will be further exchanged at the B-THENET Centres' level, thanks to the inputs and support of the platform's users/beekeeper's community, and will be evaluated again.

Online validation will remain open until the end of December 2023, when results of the practical validation will also be reported in Deliverable D3.5 – Report on the practical validation of practices on-field M16. Then, GBPs and BMBs that received theoretical and practical validation of the beekeeping community, and received official approval of the national and international B-THENET Centres beneficiaries will be considered Best Beekeeping Practices. Subsequently, the coordinator will move them to the Repository Platform of the project to be used as training material for EU beekeepers and advisors.

4 Results of the validation of practices from the Exchange Platform

Table 2 reports the results of the preliminary validation of GBPs and BMBs from the Exchange Platform of the B-THENET project. A total of 45 practices (currently 280 are published in the Exchange Platform) received ≥ 10 votes and could therefore be assessed during this preliminary analysis. Out of those, 38 practices received $\geq 75\%$ of positive votes, while 7 practices were below the validation threshold. Positive and negative votes will be collected until December 2023, with the aim of further improving the practices published in the Exchange Platform.

Table 2. Results of the preliminary validation of the GBPs and BMBs published in the Exchange Platform of the project B-THENET.

Title	Country	Category	Like count	Dislike count	Ratio
Correct plaatsen van bijenvolken	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	32	2	94%
Een gepast aantal bijenvolken houden	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	32	1	97%
Seizoensgebonden verplaatsen van bijenvolken	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	15	16	48%
Obstakels voor de bijen vermijden	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	25	5	83%
Gebruik van oxaalzuur	belgium	Biosecurity Measures>Varroosis	24	1	96%
Veilige afstand bewaren van huizen en dorpen	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	23		100%
Toegankelijkheid van bijenhal voor auto's	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	16	5	76%
Gunstige afstand bewaren van	belgium	Good Beekeeping Practices>Apiary set-	18	3	86%

andere bijenstanden		up and management / maintenance			
Diefstal en vandalisme van bijenvolken voorkomen	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	20		100%
Varroabesmetting inschatten tijdens het bijenteeltseizoen	belgium	Biosecurity Measures>Varroosis	20		100%
Gebruik van thymol	belgium	Biosecurity Measures>Varroosis	9	11	45%
Opsluiten van de koningin	belgium	Biosecurity Measures>Varroosis	16	4	80%
Blootstelling aan vervuiling voorkomen	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	18	1	95%
Blootstelling aan extreme vochtigheid en wind mijden	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	19		100%
Aanwezigheid van bomen (of andere barrières) tegen weer stressoren	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	19		100%
Voorziening van opbergruimte op de bijenstand	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	16	2	89%
Varroabehandeling afstemmen op de nationale klimaatzone	belgium	Biosecurity Measures>Varroosis	18		100%
Verwijderen van broed	belgium	Biosecurity Measures>Varroosis	10	8	56%
Gebieden mijden waar allergene of toxische planten voorkomen	belgium	Good Beekeeping Practices>Apiary set-up and management / maintenance	4	13	24%
Gebruik van mierenzuur	belgium	Biosecurity Measures>Varroosis	8	9	47%
Gebruik van andere producten met lage impact op het milieu	belgium	Biosecurity Measures>Varroosis	3	7	30%

Hitte behandeling	belgium	Biosecurity Measures>Varroosis	4	6	40%
Osigurati dovoljan razmak pčelinjaka od naseljenog mjesta	croatia	Good Beekeeping Practices>Apiary set-up and management / maintenance	11		100%
Pravilno postavljanje košnice - pregled pčelinje zajednice	croatia	Good Beekeeping Practices>Apiary set-up and management / maintenance	10		100%
Valutare il livello di infestazione da varroa durante la stagione apistica	italy	Biosecurity Measures>Varroosis	9	1	90%
Monitorizar y mantener el número de ácaros de varroa por debajo del umbral nocivo	spain	Biosecurity Measures>Varroosis	13		100,0%
Identificación del mejor momento para realizar los tratamientos en función del área climática nacional	spain	Biosecurity Measures>Varroosis	11		100,0%
Emplear correctamente el ácido oxálico	spain	Biosecurity Measures>Varroosis	11		100,0%
Emplear correctamente el ácido fórmico	spain	Biosecurity Measures>Varroosis	11		100,0%
Emplear correctamente el timol	spain	Biosecurity Measures>Varroosis	11		100,0%
Emplear correctamente otros compuestos de bajo impacto ambiental	spain	Biosecurity Measures>Varroosis	11		100,0%
Eliminación de la cría	spain	Biosecurity Measures>Varroosis	13		100,0%
Interrupción de la cría mediante la separación de las reinas	spain	Biosecurity Measures>Varroosis	11		100,0%

Tratamientos térmicos	spain	Biosecurity Measures>Varroosis	11		100,0%
Evitar la exposición a los contaminantes	spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	13		100,0%
Colocar el colmenar en un lugar accesible con vehículos	spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	18		100,0%
Mantener una distancia adecuada con respecto a viviendas habitables o aldeas	spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	13		100,0%
Evitar robos de las colmenas	spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	14		100,0%
Mantener un ratio equilibrado de número de colmenas instaladas y la cantidad de plantas/recursos hídricos y melíferos en el área en el que el colmenar es instalado	spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	13		100,0%
Recolocación del colmenar en función de la estación del año	spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	13		100,0%
Correcta colocación de la colmena	spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	13		100,0%
Evitar obstáculos cerca de la piquera	spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	15		100,0%
Contar con suficiente espacio	spain	Good Beekeeping Practices>Apiary set-	20		95,2%

para almacenar materiales y herramientas		up and management / maintenance		1	
Mantener una distancia adecuada con otros colmenares	Spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	16	1	94,1%
Evitar áreas con plantas alergénicas o tóxicas presentes en cantidades significativas	Spain	Good Beekeeping Practices>Apiary set-up and management / maintenance	13	2	86,7%

5 Conclusions

The present deliverable reports the preliminary results of the validation of practices from the Exchange Platform of the project B-THENET. By the end of September 2023, 38 out of the 280 practices published online received $\geq 75\%$ of positive votes. The exchange carried out between the 13 National B-THENET Centres and the EU community of beekeepers and advisors will continue until the 31st of December 2023. By then, practices that will receive theoretical and practical validation as well as official approval of the National and International B-THENET Centres beneficiary will be considered “Best Beekeeping Practices”. The coordinator will then place them in the Repository Platform where they will serve as training material for EU beekeepers and advisors.

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